INSTALLATION & OPERATING MANUAL
INVO SERIES
5KVA INVERTER / CHARGER
INVC5048H

www.unipowerco.com

Manual No. INVO-4
10/13 invo-man-Rev4.indd

© 2013 UNIPOWER LLC
All Rights Reserved

NORTH AMERICA • 3900 Coral Ridge Drive, Coral Springs, Florida 33065, USA • Tel: +1 954-346-2442 • Fax: +1 954-340-7901 • sales-northamerica@unipoweco.com
EUROPE • Parkland Business Centre, Chartwell Road, Lancing BN15 8UE, ENGLAND • Tel: +44(0)1903 768200 • Fax: +44(0)1903 764540 • sales-europe@unipoweco.com

CONTENTS

1.0 INTRODUCTION 4
2.0 FEATURES.....5
3.0 WARRANTY (summary) 5
3.0 ABOUT THIS MANUAL.....5
4.0 SAFETY INSTRUCTIONS.....6
5.0 UNPACKING AND INSPECTION.....8
6.0 GENERAL SPECIFICATIONS.....9
7.0 INSTALLATION 11
8.0 OPERATION 16
9.0 PERFORMANCE TABLES 20
10.0 FAULT DIAGNOSIS & TROUBLESHOOTING.....23

FIGURES

Figure 1 - INVO Series Inverter Charger 4
Figure 1 - Utility Backup 11
Figure 2 - Battery String Wiring 12
Figure 3 - Battery Cable Connection 13
Figure 4 - AC Cable Connection 14
Figure 5 - Front Panel 16
Figure 5 - LCD Display 17

TABLES

Table 1 - Minimum Recommended Battery Cable Size & Torque Value 12
Table 2 - Minimum Recommended AC Cable Size & Torque Value 14
Table 3 - Configuration Button Function 16
Table 4 - Configuration Button Function 17
Table 5 - Charge Mode Battey Indicator 18
Table 6 - Inverter Mode Battey Indicator 18
Table 7 - Line Mode Performance 20
Table 8 - Inverter Mode Performance 21
Table 9 - Charge Mode Performance 22
Table 10 - Fault Codes & Audible Alarms 23

1.0 INTRODUCTION

UNIPOWER's **INVO** is a 5kVA high frequency pure sinewave inverter/charger designed to be used in long-run UPS applications where the reliability or availability of the utility grid supply is poor.

In normal operation **INVO** feeds the utility supply directly to the load while at the same time the 3 stage charger keeps the battery fully charged at all times. In the event of utility failure **INVO** automatically transfers the load to the inverter and monitors the battery charge state.

Using a typical 100AH battery **INVO** will maintain the load for over 45 minutes and the 30A charger will replenish the battery in less than 4 hours.

INVO is ideal for use in the small office or retail environment where a small number of PCs and EPOS terminals or even air conditioning units need to be kept operational during power outages.

.

Figure 1 - INVO Series Inverter Charger

2.0 FEATURES

- 90% Minimum Efficiency
- Wide Range AC Input
- Up to 5kVA or 4200W Output Power
- 10kVA Peak Load
- Fast 10mS Transfer Time
- 3 Stage (CC/CV/Float) 30A Charger
- Charger Power Factor >0.95

3.0 WARRANTY (summary)

INVO Series inverter/chargers are warranted for two (2) years from date of shipment against defects in material and workmanship. This warranty does not extend to products which have been opened, altered or repaired by persons other than persons authorized by the manufacturer or to products which become defective due to acts of God, negligence or the failure of customer to fully follow instructions with respect to installation, application or maintenance.

For a complete text of UNIPOWER's warranty conditions please request a copy from your local Sales Office.

3.0 ABOUT THIS MANUAL

3.1 Purpose

The purpose of this manual is to provide explanations and procedures for installation, operation and troubleshooting. This manual should be read carefully before installation and operation.

Please retain this manual for future reference.

3.2 Scope

This document defines the functional requirements of the inverter/charger, which is intended for worldwide use in electronic data processing applications. All manuals are applicable under all operating conditions when installed in the End Use system, unless otherwise stated.

4.0 SAFETY INSTRUCTIONS

WARNING: This chapter contains important safety and operating instructions. Read and keep this User Guide for future reference.

4.1 General Precautions

a) Before using the inverter/charger, read all instructions and cautionary markings on:

The inverter/charger.
The batteries.
All appropriate sections of this manual.

b) CAUTION - To reduce risk of injury, charge only deep-cycle lead acid type rechargeable batteries. Other types of batteries may burst, causing personal injury and damage.

c) Do not expose the inverter/charger to rain, snow or liquids of any type. The inverter/charger is designed for indoor use only. Protect the inverter/charger from splashing if used in vehicle applications.

d) Do not disassemble the inverter/charger. Take it to a qualified service center when service or repair is required. Incorrect re-assembly may result in a risk of electric shock or fire.

e) To reduce risk of electric shock, disconnect all wiring before attempting any maintenance or cleaning. Turning off the inverter/charger will not reduce this risk.

f) WARNING: WORKING IN THE VICINITY OF A LEAD ACID BATTERY IS DANGEROUS. BATTERIES GENERATE EXPLOSIVE GASES DURING NORMAL OPERATION.

Provide ventilation to outdoors from the battery compartment. The battery enclosure should be designed to prevent accumulation and concentration of hydrogen gas in “pockets” at the top of the compartment. Vent the battery compartment from the highest point. A sloped lid can also be used to direct the flow to the vent opening location.

g) NEVER charge a frozen battery.

h) No terminals or lugs are required for hook-up of the AC wiring. AC wiring must be no less than 10 AWG gauge copper wire and rated for 75oC or higher. Battery cables must be rated for 75oC or higher and should be no less than as stated in table 1. Crimped and sealed copper ring terminal lugs with a 5/16 hole should be used to connect the battery cables to the DC terminals of the inverter/charger. Soldered cable lugs are also acceptable.

i) Be extra cautious when working with metal tools on, or around batteries. The potential exists to drop a tool and short-circuit the batteries or other electrical parts resulting in sparks that could cause an explosion.

j) No AC or DC disconnects are provided as an integral part of this inverter/charger. Both AC and DC disconnects must be provided as part of the system installation. See INSTALLATION section of this manual.

k) No over current protection for the battery supply is provided as an integral part of this inverter/charger. Over current protection of the battery cables must be provided as part of the system installation. See INSTALLATION section of this manual.

l) GROUNDING INSTRUCTIONS - This inverter/charger should be connected to a grounded permanent wiring system. For most installations, the Ground Lug should be bonded to the grounding system at ONLY one in the system. All installations should comply with all national and local codes and ordinances.

4.2 Personel Precautions

a) Someone should be within range of your voice to come to your aid when you work near batteries.

b) Have plenty of fresh water and soap nearby in case battery acid contacts skin, clothing, or eyes.

c) Wear complete eye protection and clothing protection. Avoid touching eyes while working near batteries. Wash your hands when done.

d) If battery acid contacts skin or clothing, wash immediately with soap and water. If acid enters eyes, immediately flood eyes with running cool water for at least 15 minutes and get medical attention immediately.

e) Baking soda neutralises lead acid battery electrolyte. Keep a supply on hand in the area of the batteries.

f) NEVER smoke or allow a spark or flame in the vicinity of a battery or generator.

g) Be extra cautious when working with metal tools on and around batteries. The potential exists to short-circuit the batteries or other electrical parts which may result in a spark that could in turn cause an explosion.

Remove personal metal items such as rings, bracelets, necklaces, and watches when working with a battery. A battery can produce short-circuit currents high enough to weld a ring or the like to metal, causing severe burns.

If a remote or automatic generator start system is used, disable the automatic starting circuit and/or disconnect the generator from its starting battery while servicing to prevent accidental starting during servicing.

5.0 UNPACKING AND INSPECTION

5.1 This INVO Series inverter/charger was carefully tested, inspected and packaged for shipment from our factory. Upon receipt the unit should be carefully unpacked and inspected for any damage in shipment. The following items are included:

- The Inverter/Charger
- 1 DC red cable
- 1 DC black cable
- 1 User's manual (this document)

5.2 If there is evidence of damage, **do not attempt to install the unit**. The freight carrier should be notified immediately and a claim for the cost of the unit should be filed with the carrier for direct reimbursement. Be sure to include the model and serial number of the damaged unit in all correspondence with the freight carrier. Also save the shipping carton and packing material as evidence of damage for the freight carrier's inspection.

5.3 UNIPOWER will cooperate fully in case of any shipping damage investigation.

5.4 Always save the packing materials for later use in shipping the unit. Never ship the unit without proper packing.

6.0 GENERAL SPECIFICATIONS

INPUT

AC

Nominal Voltage ..... 230VAC single phase
Voltage Range ..... Normal range - 180-270VAC single phase
Generator Mode (Wide Range)[1] - 100-270VAC single phase
Current ..... 30A max. @ 230VAC
Frequency 47-63Hz

Battery[2]

Nominal Voltage 48VDC
Current ..... 120A max.
UV Alarm ..... 42VDC ±1.2VDC
UV Shut-Down[3] ..... 40VDC ±1.2VDC

OUTPUT

Continuous Power ..... 5000VA / 4200W
Maximum Peak Power 10,000VA
Motor Load 2.5HP
Voltage (Inverter) ..... 220/230/240VAC single phase
Voltage Regulation (Inverter) ..... ±10%
Frequency ..... 50Hz or 60Hz
Frequency Regulation (Inverter) ..... ±0.1Hz
Overload Capacity ..... 110-150% - 10s
150-200% - 5s
Output Waveform ..... Pure Sinewave
Transfer Time ..... AC to DC - 10ms Typical
DC to AC - 20ms Typical
Efficiency ..... AC to DC (Bypass) - >95%
DC to AC (Inverter) - >90%
Protection ..... Overload, Over Temperature

USER INTERFACE (front panel)

Display ..... Back-lit LCD
Input ..... Function Keys

BATTERY CHARGER

Charger Algorithm ..... 3 stage profile (CC/CV/Float)
Battery Type Settings ..... Flooded/AGM/GEL
Charger Current 20A/35A
DC Voltage 48V
Overcharge Protection 60V
Charger Power Factor ..... >0.95
Protection ..... Discharge, Overcharge, Overload

ENVIRONMENTAL

Operating Temp. Range ..... 0°C to +45°C
Storage Temp. Range ..... -15°C to +60°C
Altitude 0-1500m
Humidity ..... 0% to 95%, Non-Condensing
Cooling ..... Integral Fans
Acoustic Noise ..... <60dB

SAFETY & EMI

Safety Compliance EN60950-1
EMI Classification ..... EN62040-2, CLASS A

PHYSICAL SPECIFICATIONS

Case Material ..... Steel
Dimensions, Inches (mm) ..... 4.3 H x 16.0 W x 13.8 D
(110 x 407 x 350)
Weight ..... 19.8 lbs. (9kg.)

Notes
1. Minimum continuous operation is 180VAC.
2. Not to be connected to any other DC source.
3. Requires a minimum battery voltage of 44V to start / re-start.
4. All specification typical at nominal line, full load and 25°C ambient unless otherwise stated.

7.0 INSTALLATION

7.1 Basic Configuration

The following illustration shows the basic utility backup application for the Invo Series 5KVa inverter/charger.

For other application configurations such as renewable energy systems using solar or wind power please contact sales.

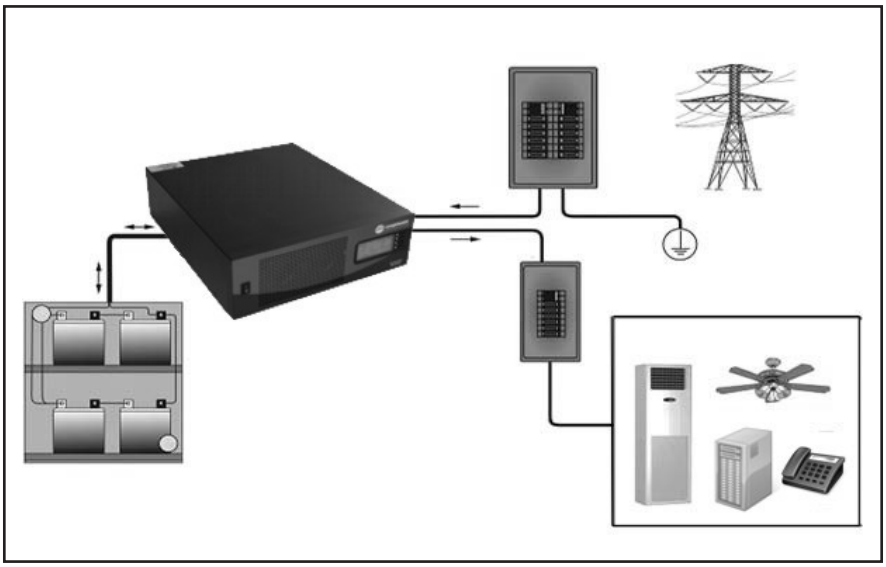


Figure 1 - Utility Backup

The Invo Series 5KVA Inverter/Charger can feed almost any kind of appliance including those with motor characteristic, e.g. fluorescent lights, fans, refrigerators and air conditioners.

Note: Appliances such as air conditioners often require at least 3 minutes to restart after a short-term power outage (time is required to balance the refrigerant gas in inside circuit). In order to protect your air conditioner, please consult the manufacturer whether they have already provided a time delay function before installing the INVO Series inverter; otherwise, the inverter will trigger an overload fault and shut off its output to protect your appliance. Even so there is some risk of damage to the air conditioner for which UNIPOWER cannot be held responsible.

7.2 Batteries

The INVO inverter/charger supports a 48 volt. Please refer to figure 2 for wiring the battery correctly. Before proceeding, ensure you have appropriate size batteries for your application. The INVO inverter/charger can be used with flooded lead-acid, or sealed GEL/AGM lead-acid batteries so ensure that your batteries are in one of these categories.

The battery must be wired to match the inverter/chargers DC input voltage specifications. We recommend that the battery capacity not smaller than 100AH.

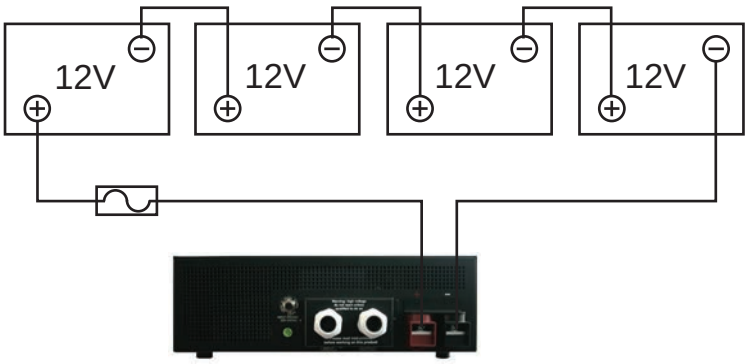


Figure 2 - Battery String Wiring

7.3 Battery Cable Size

The following table shows the minimum recommended battery cable size. Be sure the cable you select is no smaller than this.

Typical DC Current	Cable length 1~3m per pole	Battery Terminal Torque value
100A	4AWG	10~15 Nm

Table 1 - Minimum Recommended Battery Cable Size & Torque Value

7.4 Battery Cable Connection

Observe Battery Polarity! Place the ring terminal of the DC cable over the bolt and directly against the inverter/charger's battery terminal. Tighten the M8 screw to 5-8 Nm. Do not place anything between the flat part of the Backup terminal and the battery cable ring terminal or overheating may occur. **DO NOT APPLY ANY TYPE OF ANTI-OXIDANT PASTE TO TERMINALS UNTIL AFTER THE BATTERY CABLE WIRING IS TORQUED!!**

Figure 3 below illustrates the proper method to connect the battery cables to the inverter/charger terminals.

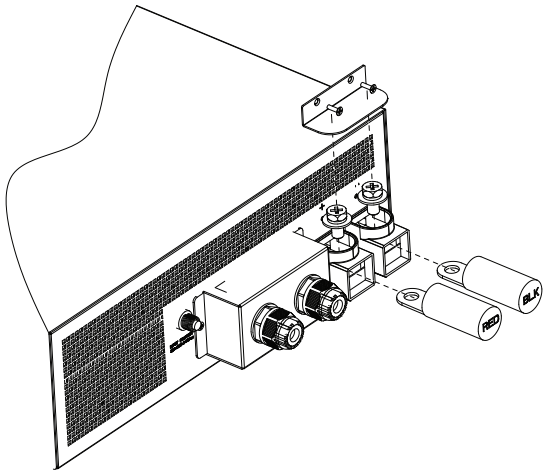


Figure 3 - Battery Cable Connection

WARNING: Shock Hazard. Installation must be performed with care for the high battery voltage in series.

Caution!! Do **NOT** place anything between battery cable ring terminals and terminals on the inverter. The terminal screw is not designed to carry current.

Apply Anti-oxidant paste **AFTER** terminals have been tightened.

Verify that the cable lugs are flush with the battery terminals.
Tighten battery cables to terminals (10~15 Nm).

7.5 DC Disconnect and Over-Current Protection

For safety and to comply with regulations, battery over-current protection and disconnect devices are required. Fuses and disconnects must be sized to protect the DC cable size used, and must be rated for DC operation. Do not use devices rated only for AC service – they will not function properly.

Note that some installations may not require a disconnect device, although over-current protection is still required.

7.6 AC Cable Size

Before wiring the input and output of the inverter, refer to table 2 below for minimum recommended cable sizes and torque values.

AC Input	AC Output	Torque value
10AWG	10AWG	1.2~1.8 Nm

Table 2 - Minimum Recommended AC Cable Size & Torque Value

7.7 AC Connections

Installation should be done only by a qualified electrician. Consult the local codes for the proper wire sizes, connectors and conduit requirements.

On the left of rear chassis is the AC hardwire cover. A six-way terminal block is provided to make the AC connections. The terminal block is used to hardwire the AC input, AC output, and ground. The National Electrical Code requires that an external disconnect switch be used in the AC input wiring circuit. The AC breakers in a sub panel will meet this requirement.

a) Disconnect the inverter/charger from the battery either by turning off the battery switch or removing the battery cables from the battery. Turning off the inverter/charger does not constitute disconnecting from the battery.

b) Feed the wires through the cable clamp and AC cover. See Figure 4 below.

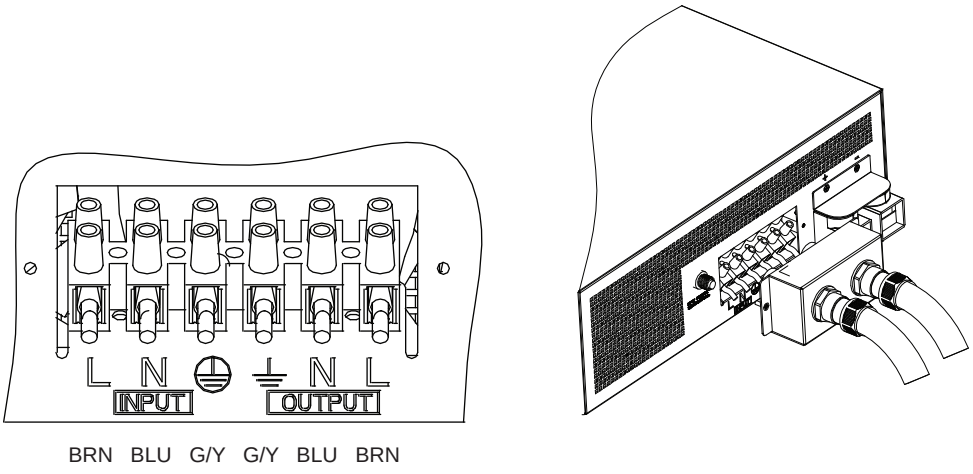


Figure 4 - AC Cable Connection

c) Following the wiring guide located in the AC wiring compartment as Figure 4, connect the GND (green/yellow), Line (brown), and neutral (blue) wires from the AC input (utility, generator, etc.) to the terminal block.

Caution!! Be sure that AC source is disconnected before attempting to hardwire it to the inverter/charger.

d) Connect the AC Line output wiring to the terminal marked AC Line (output) following the wiring guide inside the compartment. Connect the AC neutral out to the AC neutral out terminal. Torque the wires into the terminal block.

e) Use the two M3 screws to lock the AC cover.

f) Tighten the clamps on the AC cable jackets (not the individual wires) to provide strain relief for the connections.

8.0 OPERATION

8.1 Front Panel Controls and LCD Display

Figure 5 shows the controls and display on the front of the INVO Series inverter/charger. They control and provide information in both inverter and battery charging modes of operation.

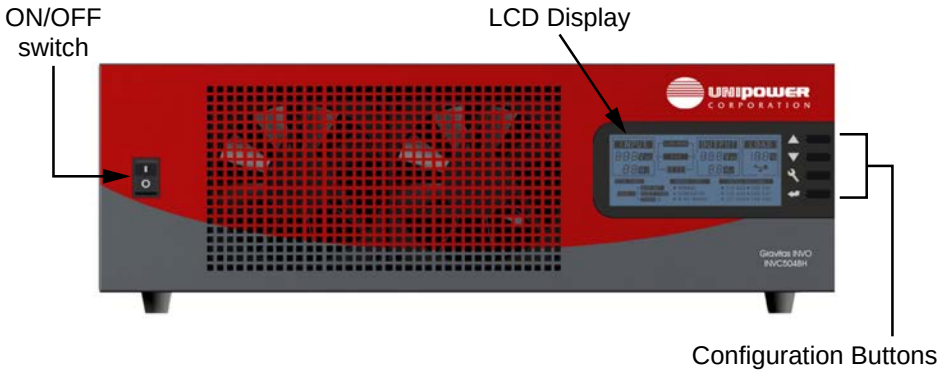


Figure 5 - Front Panel

8.1.1 Power ON/OFF

Located on the left of the panel is the ON/OFF Switch. Once the inverter/charger has been properly installed and the batteries connected, press this switch to the ON position to switch on the inverter/charger.

Important Note: INVO Series has a fail-safe system that will not allow it to switch on unless batteries are connected and the charge voltage of the batteries is above 42V.

8.1.2 Configuration Buttons

On the right of panel are the 4 configuration switches which setup the inverter/charger operation parameters. See table 3 for details.

Button	Function	Description
	up	Move up to pre-select
	down	Move down to pre-select
	configuration	Enter configuration mode, and turn page
	enter	Enter to confirm

Table 3 - Configuration Button Function

After you press configuration button and enter configuration mode, there is a total of 4 configuration pages. Change the page by pressing the configuration button again.

Page	Description	Selectable option
1	Input range	Normal / Generator / Wide Range
2	Output range	220V / 230V / 240V
3	Battery type	AGM / GEL / FLOODED
4	Charger current	35A/20A
5	Saver mode	ON/OFF

Note: The 220v and 240v output function is reversed for further feature.

Table 4 - Configuration Button Function

8.1.3 LCD Display

The LCD display provides system status, and the user-friendly panel eases program settings. See Figure 6.

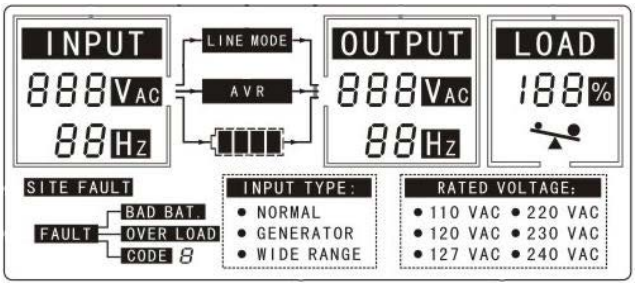


Figure 5 - LCD Display

AC Mode Indicator

The line mode symbol will show and the indicator will display the input voltage, output voltage and load.

Inverter Mode Indicator

The inverter mode symbol will show and the indicator will display the input voltage, output voltage, load.

The battery capacity segment will indicate the battery capacity depending on the battery voltage level.

Charging Indicator

When line mode and input within range, the charging symbol will show up. And battery capacity segment will roll flashing in turn basing on capacity.

Charger mode battery indicator

Status	Battery Capacity					
		5	4	3	2	1
CC/CV	75% ~ 100%	ON	Flash 1	Solid ON	Solid ON	Solid ON
	50% - 75%	ON	Flash 2	Flash 1	Solid ON	Solid ON
	25% ~ 50%	ON	Flash 3	Flash 4	Flash 1	Solid ON
	0% ~ 25%	ON	Flash 4	Flash 3	Flash 2	Flash 1
	Low Battery	Flash	Flash 4	Flash 3	Flash 2	Flash 1
Floating	Full	ON	Solid ON	Solid ON	Solid ON	Solid ON

Table 5 - Charge Mode Battey Indicator

Inverter mode battery indicator

Battery Capacity						
	5	4	3	2	1	Alarm
Full	ON	ON	ON	ON	ON	--
75%	ON	OFF	ON	ON	ON	--
50%	ON	OFF	OFF	ON	ON	--
25%	ON	OFF	OFF	OFF	ON	--
0%	ON	OFF	OFF	OFF	OFF	--
Low Alarm	Flash	OFF	OFF	OFF	OFF	1 beep / 2s
Off	Flash	OFF	OFF	OFF	OFF	--

Table 6 - Inverter Mode Battey Indicator

Load indicator

The load indicator shows the load percentage in VA or W, whichever is bigger, the overload indicator will flash when an overload is present.

8.2 Battery Charger

8.2.1 Inverter to Charger Transition

The internal battery charger and automatic transfer relay allow the inverter/charger to operate as either a battery charger or an inverter (but not both at the same time). The inverter/charger automatically becomes a battery charger whenever AC power is supplied to its AC input. The AC input is internally connected to the AC output while in battery charger mode.

8.2.2 Charger Terminology

a) ***Constant Current Stage*** - During this cycle, the batteries are charged at a constant current.

b) ***Constant Voltage Stage*** - During this cycle, the batteries are held at a constant voltage (14.1V per 12V block for AGM & GEL, 14.6V per 12V block for FLOODED) and accept whatever current (less than the current in CC stage) is required to maintain this voltage. This ensures full charging.

c) ***Float Stage*** - During this cycle, the batteries are held at the float voltage (13.5V per 12V block).

d) Whenever the AC is reconnected, the charger will reset the above cycle.

e) If the charger maintains the float state for 21 consecutive days, the charger will reset the cycle.

8.3 Circuit Breaker

The inverter/charger contains one input circuit breaker located on the rear panel of the chassis, next to the AC input terminal block. This circuit breaker protects the charger and bypass circuits. The circuit breaker will trigger if the input is over-current. The circuit breaker is push to reset.

9.0 PERFORMANCE TABLES

9.1 Line Mode

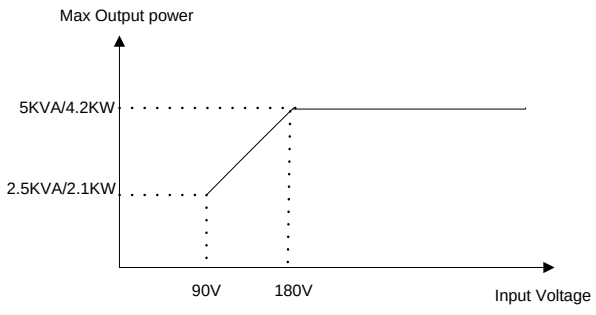
PARAMETER	SPECIFICATION
Input Voltage Waveform	Sinusoidal (Utility or Generator)
Nominal Input Voltage	230Vac
Low Line Disconnect	170Vac (Normal) 90Vac (Generator/Wide Range)
Low Line Reconnect	180Vac (Normal) 100Vac (Generator/Wide Range)
High Line Disconnect	280Vac
High Line Re-connect	270Vac
Max AC Input Voltage	300Vac rms
Nominal Input Frequency	50Hz/60Hz (Auto-detect)
Low Line Frequency Disconnect	40 ±1Hz
Low Line Frequency Reconnect	42 ±1Hz
High Line Frequency Disconnect	65 ±1Hz
High Line Frequency Reconnect	63 ±1Hz
Output Voltage Waveform	Same as Input Waveform
Output Short Circuit Protection	Circuit Breaker 40A
Efficiency	>95%
Transfer Switch Rating	40A
Transfer Time (AC to DC)	10ms (typical) 20ms (maximum)
Transfer Time (DC to AC)	10ms (typical) 20ms (maximum)
Power Limiting	

Table 7 - Line Mode Performance

9.2 Inverter Mode

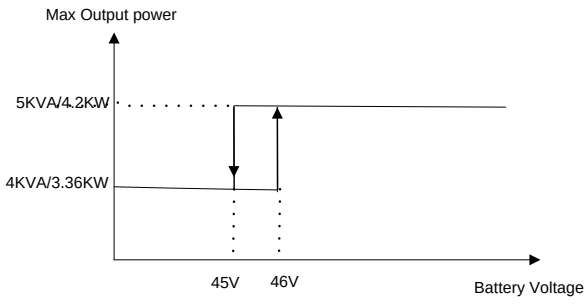
PARAMETER	SPECIFICATION
Output Voltage Waveform	Pure Sine Wave
Rated Output Power	5,000VA
Power Factor	0.84
Nominal Output Voltage	230Vac
Output Frequency	50Hz/60Hz ±1Hz
Output Voltage Regulation	±10% rms
Nominal Efficiency	>90%
Over-Load Protection	fault after 5s@≥150% load fault after 10s@110%~150% load
Surge rating	10,000VA
Capable of starting electric motor	2.5HP
Output Short Circuit Protection	Current limit (Fault after 4 cycles max.)
Bypass Breaker Size	40A
Nominal DC Input Voltage	48V
Min DC start voltage	40V
Low DC Alarm	42.0 ±1.2Vdc
Low DC Alarm Recovery	43.2 ±1.2Vdc
Low DC Shut-down	40.0 ±1.2Vdc
Low DC Shut-down Recovery	44.0 ±1.2Vdc
High DC Shut-down	60.0 ±1.2Vdc
High DC Shut-down Recovery 1	58.0 ±1.2Vdc
Power saver setting	0W (Set “OFF” at LCD) 10W ±5W enter 5+/-2W leave (Set “ON” at LCD)
Tare loss (nominal)	Saver OFF: <50W, Saver ON: <10W
DC component of AC output	<100mV
Half wave load detection	Yes (when unbalance current>35A)
Power Limitation	

Table 8 - Inverter Mode Performance

9.3 Charge Mode

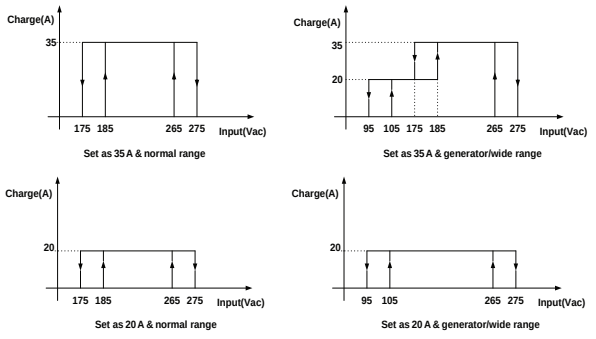
PARAMETER	SPECIFICATION
Nominal Input Voltage	230Vac
Input Voltage Range	180V~ 270Vac (Normal range) 100V~ 270Vac (Generator / Wide Range)
Nominal Output Voltage	Determined by battery type
Nominal Charge Current	20A (95-175V, gen/wide only) 35A (175-275V) @ 35A setting 20A(175-275V) @ 20A setting
Battery initial voltage (sps setup)	>35Vdc
Charger Short Circuit Protection	Inverter/charger shuts down automatically
Over Charge Protection	Batt.V≥60Vdc, Fault, Buzzer alarm
Charge Algorithm	Three stage: Boost CC (constant current stage) → Boost CV (constant voltage stage) → Float (constant voltage stage)
Battery Type Setting (±0.3V/batt.)	Battery Type / Boost CC/CV Voltage(V) / Float Voltage(V) Flooded: 58.4 / 53.6 AGM/Gel: 56.4 / 54
Charger current (+/-10%)	

Table 9 - Charge Mode Performance

10.0 FAULT DIAGNOSIS & TROUBLESHOOTING

10.1 Fault Diagnosis

The following table lists INVO Series the fault codes and audible alarms that can be used to aid in troubleshooting error conditions.

Fault Code	Protect Function	Active Mode	Condition	Warning (O/P=ON)	Fault (O/P=OFF)	Restart	
						Operate	Condition
--	Low DC Voltage Alarm	Inverter	DC Voltage <Low DC Alarm	1beep/2s	--	--	--
0	Low DC Voltage Protection	Inverter	DC Voltage <Low DC Shut-down	--	Beep continuous	Auto	Mains is normal
1	Over Charge Protection	Line	DC Voltage >High DC input Shut-down	Beep continuous	--	Manual	--
1	Over Voltage Protection	Standby	DC Voltage >High DC input Shut-down	--	Beep continuous	Auto	DC Voltage <High DC input Shut-down Recovery
2	Over Load Protection	Line/ Inverter	110%~150% load	1beep/0.5s, and continuous 10s	Beep continuous	Manual	--
			>150% load	1beep/0.5s, and continuous 5s	Beep continuous	Manual	--
3	Output Short Circuit Protection	Inverter	Output Voltage <20Vrms	--	Beep continuous	Manual	--
4	Fan Fault Protection	Line/ Inverter	Fan Locked Fan Defected	2beep/2s, and continuous 1min	Beep continuous	Manual	--
5	Over Temp Protection	Line/ Inverter	HEATSINK Temp ≥100°C	--	Beep continuous	Auto	HEATSINK Temp ≤55°C
6	Back-EMF Protection	Standby	Reverse input and output	--	Beep continuous	Manual	--
9	Output Abnormal	Inverter	(Output Voltage <170Vrms and output current under 32Arms) or Output Voltage >280Vrms	--	Beep continuous	Manual	--

Table 10 - Fault Codes & Audible Alarms

10.1 Troubleshooting

The following table lists common fault conditions and their remedy.

Problem	Possible Cause	Remedy
No LCD display	Battery low, <35V	Re-charge battery.
	Battery defective, cannot charge	Replace battery.
	Power switch OFF	Set power switch ON.
	Battery polarity reversed, Cannot start unit	Return to UNIPOWER for repair.
Mains normal but operates in inverter mode	AC input missing	Check AC input connections.
	Input breaker triggered	Reset breaker.
Alarm buzzer beeps continuously	Overload	Verify that the load matches the capability specified.
	Output short circuit	Check wiring or remove abnormal load.
	Over temp	Remove any obstruction in front of airflow inlet.
	Over charger	Restart the inverter/charger
	Over voltage	Lower the DC input voltage under the high DC Input shut-down recovery point: 58.0 ±1.2Vdc.
	Fan fault	Check for any fan obstruction. If none, fan should be replaced.
	Back-EMF	Make sure mains is normal to recharge the battery. If not, switch the power off until mains is normal.
	DC voltage under the low DC shut-down threshold	
Back up time is shortened	Overload	Remove some non-critical load.
	Battery voltage is too low	Charge battery for 8 hours or more.
	Battery bank is too small	Increase battery bank capacity.

In the event that you are unable to rectify the fault using the above guide please contact technical support for assistance:

Tel: US - +1 954 346 2442 or UK - +44 1903 768200

Email: Sales-NorthAmerica@unipowerco.com or Sales-Europe@unipowerco.com.

This document is believed to be correct at time of publication and UNIPOWER LLC accepts no responsibility for consequences from printing errors or inaccuracies. Specifications are subject to change without notice.